

**Revenue Forecasting Methodology**

The University of Memphis forecasters independently prepare quarterly reports of revenue updates and forecasts for use in the internal decision-making done in the City of Memphis Finance Department. The forecasts have two areas of focus: forecasts for the current fiscal year's end-of-year revenues and forecasts for the next fiscal year and for each year out for ten years.

A team of Ph.D. economists report on current economic trends that influence the City of Memphis. National, state and local economic indicators receive full discussion in both an oral presentation and written documents. These perspectives are essential for the finance department to understand and respond to a second area of focus. In the second part of the quarterly report, the team prepares numerical forecasts for the current fiscal year's end-of-year revenues, for the next fiscal year, and for each year out for ten years. The forecasts are for more than fifty revenue variables, including total revenue for the city's general fund, subgroups of revenue sources, and individual revenue sources. The format of the forecast involves a median forecast as the single most likely value and a high/low range to indicate the degree of uncertainty. Also, for the most important single revenue sources and for total revenue, there is a more detailed risk analysis. This involves developing a downside risk assessment expressed as the probability that revenues will be at or below important levels.

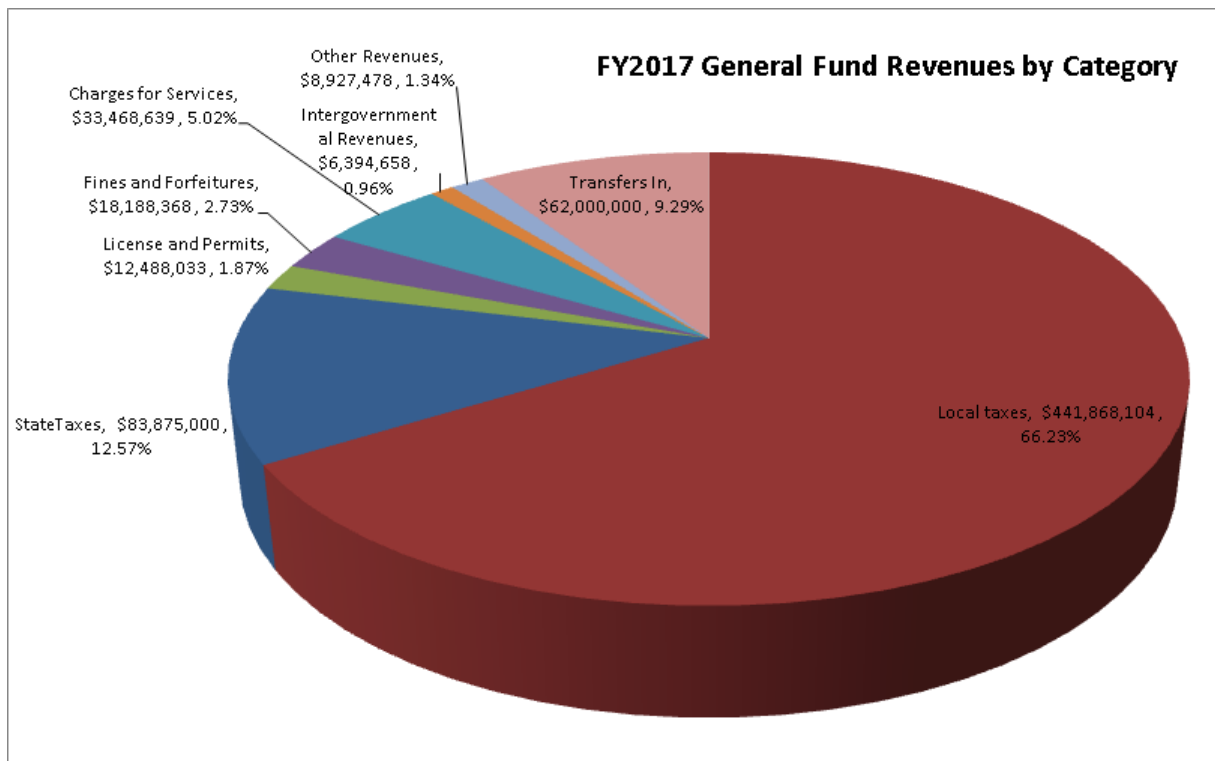
The smallest revenue sources are forecasted with autoregressive, integrated, moving average models estimated with monthly or annual data that extends back to 1968 in some cases. Major revenue sources get forecasts from at least two alternative statistical models. For some variables, seasonal patterns are so reliable that end-of-year totals are accurately predicted from year-to-date data used in some of the quarterly updates. For longer-term forecasts, entirely different models are necessary. For some of the revenue sources, national and regional economic indicators are useful to add to short and long term forecast accuracy. These statistical models are combinations of autoregressive, integrated, moving average (ARIMA) modeling and regression analysis. Although some series are estimated with single equation models, others have simultaneous equation models. Stochastic simulations of the short- and long-term models generate empirical estimates of the probability distributions for the revenue sources. These distributions are reported both for the current fiscal year and the next fiscal year. These simulation results are used to report the high/low ranges for the revenue sources and the detailed risk analyses. The high/low range end points are defined to cover the middle 50 percent of the estimated distributions for the forecasted variables. They are, in fact, the first and third quartiles that surround the median forecast. These intervals are reported for detailed lists of revenue sources, for subcategories of the general fund, and for total revenue.

The simulation results are the basis for more detailed risk analysis of total revenue, the property tax, and the sales tax. These risk reports give the quartiles and median, plus all the deciles. For example, the first decile in the forecast distribution for total revenue is the level of revenue such that there is a 10 percent probability that revenue will be at or below that level. In addition, the risk analysis estimates the probability that revenues will be at or below key levels, such as the previous year's level and the level anticipated in the operating budget. This risk analysis is a downside risk description, giving the probability that end-of-year revenue will be short of specified values.

# GENERAL FUND

# GENERAL FUND REVENUES

Revenue Category	FY 2015 Actual	FY 2016 Adopted	FY 2016 Forecast	FY 2017 Request
Local Taxes	\$ 432,560,962	\$ 430,155,748	\$ 434,176,295	\$ 441,868,104
State Taxes	65,057,921	60,075,000	81,421,394	83,875,000
Licenses and Permits	12,253,023	11,473,033	12,357,323	12,488,033
Fines and Forfeitures	16,162,607	19,603,368	18,307,213	18,188,368
Charges for Services	31,090,876	30,601,863	31,878,863	33,468,639
Use of Money and Property	476,751	335,000	343,030	335,000
Federal Grants	1,434	117,197	0	0
State Grants	1,432,891	1,630,362	1,630,362	1,630,362
Intergovernmental Revenues	3,410,528	3,516,708	5,995,925	6,394,658
Other Revenues	11,552,466	7,048,373	8,262,231	6,962,116
Transfers In	66,350,364	80,214,789	61,107,981	62,000,000
<b>Total Revenues</b>	<b>\$ 640,349,823</b>	<b>\$ 644,771,441</b>	<b>\$ 655,480,617</b>	<b>\$ 667,210,280</b>



# GENERAL FUND

# GENERAL FUND REVENUES

Revenue	FY 2015 Actual	FY 2016 Adopted	FY 2016 Forecast	FY 2017 Request
Ad Valorem Tax - Current	\$ 240,458,721	\$ 244,000,000	\$ 247,000,000	\$ 249,470,000
Ad Valorem Tax - Current Sale of Receivables	8,943,554	8,500,000	5,882,549	7,500,000
Ad Valorem Tax Prior	8,193,774	6,000,000	4,700,000	5,200,000
Ad Valorem Tax - Prior One Time Assessment	132,686	0	102,289	0
Special Assessment Tax	510,799	558,000	638,000	558,000
Property Taxes Interest & Penalty	4,178,532	4,200,000	5,000,000	4,200,000
Bankruptcy Interest & Penalty	157,021	170,000	140,000	170,000
Interest & Penalty - Sale of Tax Rec	1,534,818	1,600,000	1,452,491	1,300,000
PILOT's	3,836,670	5,000,000	3,700,000	4,500,000
State Appointment TVA	7,694,573	7,600,000	7,788,276	7,800,000
Local Sales Tax	104,869,291	104,000,000	105,000,000	109,000,000
Graceland Surcharge	158,959	0	1,992,736	1,980,000
Beer Sales Tax	17,136,633	17,500,000	17,300,000	17,000,000
Alcoholic Beverage Inspection Fee	4,997,849	5,000,000	5,000,000	5,000,000
Mixed Drink Tax	7,407,170	6,400,000	6,400,000	6,400,000
Gross Rec Business Tax	11,861,606	10,000,000	11,500,000	11,000,000
Bank Excise Tax	619,817	400,000	954,000	954,000
Franchise Tax - Telephone	1,768,727	1,600,000	1,800,000	1,800,000
Cable TV Franchise Fees	4,334,626	4,450,000	4,300,000	4,300,000
Fiber Optic Franchise Fees	750,195	544,842	544,842	894,842
Misc Franchise Tax	842,071	750,000	840,000	840,000
Interest, Penalties & Commission	212,354	200,000	340,000	200,000
Business Tax Fees	1,158,672	900,000	1,000,000	1,000,000
Warrants and Levies	129	300	150	300
Misc Tax Recoveries	500,753	500,000	500,000	500,000
MLGW/Williams Pipeline	300,962	282,606	300,962	300,962
<b>Local Taxes</b>	<b>\$ 432,560,962</b>	<b>\$ 430,155,748</b>	<b>\$ 434,176,295</b>	<b>\$ 441,868,104</b>
State Gas - Motor Fuel Tax	\$ 0	\$ 0	\$ 11,000,000	\$ 11,000,000
Three-Cent Tax	0	0	3,500,000	3,500,000
One-Cent Tax	0	0	1,900,000	1,900,000
State Professional Privilege Tax - Athletes	3,494	1,000,000	0	0
State Sales Tax	48,583,605	47,000,000	51,000,000	52,500,000



# GENERAL FUND

# GENERAL FUND REVENUES

Revenue	FY 2015 Actual	FY 2016 Adopted	FY 2016 Forecast	FY 2017 Request
Telecommunication Sales Tax	64,700	60,000	60,000	60,000
State Income Tax	14,477,921	10,000,000	12,000,000	13,000,000
State Shared Beer Tax	309,389	315,000	315,000	315,000
Alcoholic Beverage Tax	292,198	300,000	330,000	300,000
Spec Petroleum Product Tax	1,326,614	1,400,000	1,316,394	1,300,000
<b>State Taxes</b>	<b>\$ 65,057,921</b>	<b>\$ 60,075,000</b>	<b>\$ 81,421,394</b>	<b>\$ 83,875,000</b>
Auto Registration Fee	\$ 11,362,944	\$ 10,500,000	\$ 11,500,000	\$ 11,500,000
Dog License	267,639	274,965	142,292	274,965
County Dog License Fee	26,256	83,568	59,178	83,568
042111 Liquor By Ounce License	185,914	180,000	249,353	215,000
Taxi Drivers License	26,267	20,500	20,500	20,500
Gaming Pub Amus Perm Fee	15,781	15,000	15,000	15,000
Wrecker Permit Fee	14,372	11,000	11,000	11,000
Misc Permits	119,857	100,000	57,000	80,000
Beer Application	42,838	60,000	25,000	60,000
Beer Permit Privilege Tax	166,726	140,000	190,000	140,000
Sidewalk Permit Fees	24,429	88,000	88,000	88,000
<b>Licenses and Permits</b>	<b>\$ 12,253,023</b>	<b>\$ 11,473,033</b>	<b>\$ 12,357,323</b>	<b>\$ 12,488,033</b>
Court Fees	\$ 5,691,387	\$ 6,400,000	\$ 6,010,241	\$ 5,600,000
Court Costs	6,263,630	6,800,000	6,224,186	6,300,000
Fines & Forfeitures	3,035,548	5,105,000	5,091,905	5,105,000
Seizures	108,574	50,000	138,350	50,000
Beer Board Fines	173,397	150,000	108,000	110,000
Arrest Fees	232,530	215,000	200,000	215,000
DUI BAC Fees	30,567	2,400	1,231	2,400
Sex Offender Registry Fees	74,000	262,368	32,300	262,368
Library Fines & Fees	386,174	500,000	425,000	425,000
Delinquent Collection Fees	0	100,000	0	100,000
Vacant Property Registration Fee	166,800	18,600	76,000	18,600
<b>Fines and Forfeitures</b>	<b>\$ 16,162,607</b>	<b>\$ 19,603,368</b>	<b>\$ 18,307,213</b>	<b>\$ 18,188,368</b>
Subdivision Plan Inspection Fee	\$ 130,149	\$ 90,000	\$ 90,000	\$ 90,000
Subdivision Development Fees	0	0	0	0
Admissions - Museum Workshops	2,177	0	0	0
Admissions - General	167,005	0	0	0



# GENERAL FUND

# GENERAL FUND REVENUES

Revenue	FY 2015 Actual	FY 2016 Adopted	FY 2016 Forecast	FY 2017 Request
Museum Planetarium Fee	(6,523)	0	0	0
Parking	540,021	543,000	513,861	743,000
Senior Citizen's Meals	82,039	82,000	82,000	82,000
Concessions	985,505	1,025,372	1,628,795	1,500,382
Golf Car Fees	966,916	1,072,659	1,069,392	1,057,500
Pro Shop Sales	76,461	178,361	115,126	135,500
Green Fees	1,353,235	1,670,314	1,474,776	1,565,100
Softball	72,412	91,000	72,412	91,000
Basketball	16,212	17,500	16,060	17,500
Football	528	1,000	1,250	1,000
Ball field Permit	19,226	18,000	18,000	18,000
Class Fees	62,120	55,750	56,696	55,750
Day Camp Fees	304,354	320,220	304,405	320,220
Food Service Revenue	(850)	0	0	0
After School Camp	1,000	3,000	2,160	3,000
Parking Meters	857,299	800,000	850,000	850,000
Ambulance Service	20,790,494	20,000,000	21,000,000	21,000,000
Rental Fees	951,971	614,000	1,708,501	2,025,000
MLG&W Rent	2,203	2,400	2,400	2,400
Rent Of Land	47,083	174,130	48,457	43,130
Parking Lots	315,000	315,000	315,000	315,000
Easements & Encroachments	111,556	75,000	75,000	75,000
Tax Sales Attorney Fees	594,543	500,000	580,000	525,000
Street Cut Inspection Fee	348,009	250,000	250,000	250,000
Traffic Signals	249,631	200,000	200,000	200,000
Signs-Loading Zones	26,913	15,000	15,000	15,000
Arc Lights	3,824	4,000	4,000	4,000
Wrecker & Storage Charges	446,935	500,000	394,340	500,000
Shelter Fees	197,470	181,239	108,153	181,239
Animal Vaccination	35,460	22,943	17,164	22,943
Police Special Events	589,452	700,000	165,600	700,000
Outside Revenue	0	78,500	7,500	78,500
P & S Printing	15,730	0	8,435	0
Tow Fees	735,316	1,000,000	684,380	1,000,000
Officers in the Schools	0	1,475	0	1,475
<b>Charges for Services</b>	<b>\$ 31,090,876</b>	<b>\$ 30,601,863</b>	<b>\$ 31,878,863</b>	<b>\$ 33,468,639</b>



# GENERAL FUND

# GENERAL FUND REVENUES

Revenue	FY 2015 Actual	FY 2016 Adopted	FY 2016 Forecast	FY 2017 Request
Interest on Investments	\$ 191,834	\$ 115,000	\$ 123,030	\$ 115,000
Net Income/Investors	145,574	100,000	100,000	100,000
State Litigation Tax Commission	139,343	120,000	120,000	120,000
<b>Use of Money and Property</b>	<b>\$ 476,751</b>	<b>\$ 335,000</b>	<b>\$ 343,030</b>	<b>\$ 335,000</b>
Federal Grants - Others	\$ 1,434	\$ 117,197	\$ 0	\$ 0
<b>Federal Grants</b>	<b>\$ 1,434</b>	<b>\$ 117,197</b>	<b>\$ 0</b>	<b>\$ 0</b>
St TN Highway Maint Grant	\$ 639,591	\$ 830,362	\$ 830,362	\$ 830,362
St TN Interstate	794,660	800,000	800,000	800,000
State Reimbursements	(1,360)	0	0	0
<b>State Grants</b>	<b>\$ 1,432,891</b>	<b>\$ 1,630,362</b>	<b>\$ 1,630,362</b>	<b>\$ 1,630,362</b>
International Airport	\$ 3,406,928	\$ 3,495,108	\$ 3,501,525	\$ 3,394,658
MHA	3,600	21,600	3,400	0
MATA	0	0	2,491,000	3,000,000
<b>Intergovernmental Revenues</b>	<b>\$ 3,410,528</b>	<b>\$ 3,516,708</b>	<b>\$ 5,995,925</b>	<b>\$ 6,394,658</b>
Miscellaneous Auctions	\$ 1,708,952	\$ 1,600,000	\$ 1,600,000	\$ 1,600,000
Sale Of Capital Assets	691,060	0	2,700	0
Local Shared Revenue	815,073	2,066,200	2,084,689	1,966,856
Anti-Neglect Enforcement Program	173,688	200,000	190,000	0
Property Insurance Recoveries	229,939	229,939	229,939	229,939
Rezoning Ordinance Publication Fees	4,600	10,000	6,000	10,000
Sale Of Reports	354,041	273,423	301,077	273,423
City of Bartlett	1,002,597	1,034,000	1,034,000	1,034,000
Miscellaneous Income	1,076,749	174,331	763,963	389,500
Sewer Fund Cost Allocation	1,075,000	1,075,000	1,075,000	1,075,000
Local Other Revenue	24,820	0	0	0
Court Reimbursement	1	0	0	0
Unclaimed Property	0	0	20,291	0
Fire - Misc Collections	131,645	20,000	46,513	20,000
MLGW Reimbursement	5	0	0	0
Cash Overage/Shortage	4,871	30	2,123	30
Donated Revenue	1,711	0	1,952	0
Coca - Cola Sponsorship	77,580	65,000	70,000	65,000



# GENERAL FUND

# GENERAL FUND REVENUES

Revenue	FY 2015 Actual	FY 2016 Adopted	FY 2016 Forecast	FY 2017 Request
Vendor Rebates	0	0	69,096	0
Grant Revenue - Library	36,739	16,000	(1,635)	17,000
FNMA Service Fees	911	0	289	0
Donations for Rape Kits	5,600	0	0	0
Brigham Young	5,445	0	0	0
Commissions	0	0	20,129	20,000
Miscellaneous Revenue	289,127	84,450	547,541	61,368
Misc. Library Revenue	(6,080)	0	174	0
Recovery Of Prior Year Expense	548,392	200,000	198,390	200,000
Lease Payments	3,300,000	0	0	0
<b>Other Revenues</b>	<b>\$ 11,552,466</b>	<b>\$ 7,048,373</b>	<b>\$ 8,262,231</b>	<b>\$ 6,962,116</b>
In Lieu Of Taxes - MLGW	\$ 58,514,789	\$ 58,514,789	\$ 55,200,000	\$ 55,200,000
In Lieu Of Taxes - Sewer	5,406,400	4,600,000	4,600,000	5,000,000
Oper Tfr In - State Street Aid	0	14,800,000	0	0
Oper Tfr In - Solid Waste Fund	0	0	0	0
Oper Tfr In - Misc Grants Fund	129,175	0	7,981	0
Oper Tfr In - New Arena Fund	1,000,000	1,000,000	0	0
Oper Tfr In - Debt Service Fund	0	0	0	500,000
Oper Tfr In - Sewer Operating/CIP	1,300,000	1,300,000	1,300,000	1,300,000
Oper Tfr In - Storm Water	0	0	0	0
<b>Transfers In</b>	<b>\$ 66,350,364</b>	<b>\$ 80,214,789</b>	<b>\$ 61,107,981</b>	<b>\$ 62,000,000</b>
<b>Total Revenues</b>	<b>\$ 640,349,823</b>	<b>\$ 644,771,441</b>	<b>\$ 655,480,617</b>	<b>\$ 667,210,280</b>

